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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/628,857	07/28/2003	Toru Kato	0275M-000776	3845

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EXAMINER

REESE, DAVID C

ART UNIT	PAPER NUMBER
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3677

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/628,857

Applicant(s)

KATO ET AL.

Examiner

David C. Reese

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Amendment: 4/4/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3,6,14,15,17 and 18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3,6,14,15,17 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

[1] In light of further examination and in view of certain features overlooked in the former, Examiner has decided to renounce allowed claims 14, 15, 17, 18, and objected claims 3 and 6 in the action dated 1/25/2005. Consequently, claims 3, 6, 14, 15, 17, and 18 are currently pending in the following non-final rejection.

Claim Objections

[2] Claim 1 is objected to because of the following informalities: It is unclear how the radial length of the substantially flat ring-shaped end surface, supplied by applicant as (T1), is perpendicular to the shank outer diameter (D1). It appears as if the radial length is parallel, not perpendicular to the shank outer diameter.

Appropriate correction is required.

Claim 15 is objected to because of the following informalities: it appears as if applicant left out "the straight cylinder section of" before "the hollow cavity".

Claim Rejections - 35 USC § 103

[3] The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

[4] Claims 3, 6, 14-15, and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marko et al., US- 6, 325, 584, in view of Singh et al., US-6,385,843.

Although the invention is not identically disclosed or described as set forth 35 U.S.C. 102, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a designer having ordinary skill in the art to which said subject matter pertains, the invention is not patentable.

As for Claim 3, Marko et al. teaches of a self-piercing rivet for coupling a plurality of workpieces comprising:

a flange (6) with a first diameter (22) and a shank (1) with a hollow cavity (18) extending from the flange (6), the shank defining a hollow cavity (18), and a conical section tapered from a shank end (18) and converging towards the flange (6) at angle α , wherein the shank (1) has an outer diameter (19) and a substantially flat ring-shaped end surface (12) with a radial length (12) substantially perpendicular to the shank outer diameter (19), and wherein the angle α of the conical section ranges [between about 70° and about 110°] (from Claim 1 of Marko et al., "wherein the cavity has a substantially conical portion which extends from the opening at the first end of the rivet body toward the cavity bottom and which has a taper angle between about 50° and 60°").

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Examiners note with regard to []: the use of the word "about" is not indefinite in as much as its meaning is not broad and arbitrary; rather, term is clear and flexible and "approximately" or "nearly." *Ex parte Eastwood Brindle & Knob* (PO BdApp) 163 USPQ 316. Thus, in the instant case, between about 70° and about 110° reads upon that of between about 50° and 60°.

However, Marko et al. fails to disclose expressly wherein the shank is a straight cylinder, said straight cylinder section with an inner diameter extending from the conical section.

Singh et al., teaches of a self-penetrating fastening system utilizing a self-penetrating rivet as disclosed in Fig. 1 that consists of a cylindrical shank 6 with central cavity 8, including an area of the shank 6 facing away from the rivet heat 4 the cavity 8 is in the form of a cone 9 with aperture angle α (angle of which is to be selected preferably as a function of the properties of the material of the metal sheets 1, 2 to be joined) (column 2, beginning with line 18, and more importantly, line 55). Singh et al. also teaches of wherein the thickness of the shank (6) at the straight cylinder section of the hollow cavity is 25 to 45 % of the outer diameter of the shank (the thickness of 6 is indeed 25 to 45 % of the outer diameter of the shank), and wherein the flange defines a cylindrical outer wall having an axial length.

At the time of invention, it would have been obvious to one of ordinary skill in the art to modify the shank as taught by Marko et al., to include a cylindrical section above the conical taper taught by Singh et al., in order to as Singh et al. states in Column 1, beginning with line 42, "As a result of the design of the shank cavity in the area of the free end surface in the area of the free end surface, the cavity being conical in the

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broadest sense of the word, as the rivet penetrates a workpiece more deeply the resulting higher expansion forces causes the radial movement of the rivet shank outward (effects expansion) to reach an order of magnitude such that an expansion angle β greater than 45 degrees may be reached. On the other hand, this process results in an undercut increasing the strength, the direct tensile strength in particular"). Continuing with column 3, line 39, "It is made especially clear here that the top 5 of the rivet head 4 is flush with the top of the top metal sheet 1. Fig. 4 also shows the large undercut 30 greatly enhancing the strength of the riveted joint. This undercut 30 results among other things from the large rivet shank expansion angle...").

Edwards, US-6,263,560, further show this, as he teaches of a typical known self-pierce rivet that possesses a central hole 2 (straight cylinder section with an inner diameter) extending the length of the shank of the rivet and a tapered mouth 3 (column 3, beginning with line 59). Stating from column 3, beginning with line 23, "The shank may be provided with a central hole extending from the free end of the shank towards the head. The central hole may be generally cylindrical or may be tapered, with the wider part of the hole in the region of the free end of the shank. The central hole may be provided with an outwardly tapered mouth". Lastly, from Column 5, line 19, "The objective is to achieve the necessary combination of strength for piercing and freedom to roll outwardly as the sheet material is penetrated".

Lastly, with regard to the claimed flange defining a cylindrical outer wall having an axial length 15 to 20% of the outer diameter of the shank. Marko et al., does indeed show of such a flange, but that may not be exactly 15 to 20% of the outer diameter of

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the shank. Note that those of ordinary skill in the art would appreciate that a modification such as a mere change in size of a component would be obvious. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955). See also, MPEP § 2144.04 which states: *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976) ("mere scaling up of a prior art process capable of being scaled up, if such were the case, would not establish patentability in a claim to an old process so scaled." 531 F.2d at 1053, 189 USPQ at 148.). In *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device. In the instant case, the length percentage of the flange compared with the outer diameter of the shank is not given much patentable weight because the purpose of such a feature of the two rivets are one in the same.

As for Claim 6; the instant claim has subject material emulating that from Claim 3 (see above) as well as the following:

wherein the radial length of the substantially flat ring-shaped end surface of the shank is between 3 and 10% of the outer diameter of the shank (column 5, line 27,

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stating, "The width 12 of the rivet base front 2 preferably exceeds 7% of the rivet base outside diameter 19". Also referred to in third paragraph of Claim 1.

As for Claim 14, Marko et al. in view of Singh et al. (see above Claim 1) teach of a self-piercing rivet for coupling a plurality of workpieces comprising:

a flange (6) defining an outer cylindrical wall (Marko et al. in view of 6 of Singh et al.) having an axial length; and

a shank having a body (1) with an outer radius (19) smaller than a radius of the flange (22), the shank (1) defining a hollow cavity (18), the shank (1) having a conical tapered section (18) having an angle between 70° and 110° (Marko et al. in view of Singh, column 2, line 55) and wherein the axial length is [about] 30-40% of the outer radius of the shank (same argument as presented above in Claim 3, as well as the fact that the axial length of Marko et al. is 20% of the outer diameter, which is indeed [about] 30%).

Re: Claim 15, wherein the hollow cavity has a diameter of 25 to 45% of the outer radius (see claim 1 rejection).

Re: Claim 17, defining a flat end surface adjacent the conical tapered section (12 of Marko et al.), wherein the radial length of the end surface of the shank is between about .2 and .6mm (12).

Re: Claim 18 wherein the plurality of workpieces have a first thickness and wherein the cavity has a length (20) of 70% of the first thickness.

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Conclusion

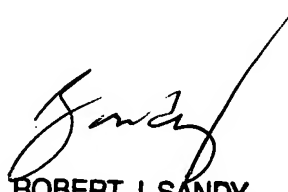
[5] THIS ACTION IS NON-FINAL

[6] Any inquiry concerning this communication or earlier communications from the examiner should be directed to David C. Reese whose telephone number is (571) 272-7082. The examiner can normally be reached on 7:30 am-6:00 pm Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, J.J. Swann can be reached on (571) 272-7075. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sincerely,
David Reese
Examiner
Art Unit 3677



ROBERT J. SANDY
PRIMARY EXAMINER